REMARKS

Claims 4, 7 and 30 are canceled; claims 2, 3, 5, 6 and 10 are amended; and claims 2, 3, 5, 6, 8-10, 31 and 32 are pending in the application.

The pending claims stand rejected as being unpatentable over Lee, Vossen and Kern, and Fujisada. Applicant has amended claim 10, from which the other pending claims depend, and believes that such amendments place all of the claims in condition for allowance.

Amended claim 10 recites a method of forming an assembly in which aluminum oxide is evaporated from a single crystal sapphire, silicon monoxide is evaporated from a source of silicon monoxide, and the evaporated aluminum oxide and silicon monoxide are mixed in a reaction chamber to form a mixture. The claim further recites that at least some of the mixture is deposited on a semiconductive material substrate to form silicon-doped aluminum oxide, and that a conductive material is formed on the deposited silicon-doped aluminum oxide.

Amended claim 10 is believed allowable over the cited references for at least the reason that the references do not suggest or disclose the claim 10 recited mixing of aluminum oxide evaporated from single crystal sapphire with evaporated silicon monoxide in a reaction chamber to form a mixture which is subsequently deposited on a semiconductive material.

Not one of the Examiner's references specifically refers to the single crystal sapphire recited in claim 10. The Examiner cites Fujisada for disclosing that alumina can be sputtered from a sapphire target. Such disclosure of Fujisada does not describe or suggest the claim 10 recited evaporation of aluminum oxide from single crystal sapphire. Applicant notes that the Examiner's other cited references also do not suggest or disclose the claim 10 recited evaporation of aluminum oxide from

single crystal sapphire. For at least this reason, the subject matter of amended claim 10 is not anticipated or suggested by any combination of the Examiner's cited references, and Applicant therefore requests allowance of claim 10 in the Examiner's next Action.

Applicant notes that the Examiner has cited Lee for disclosing that it can be advantageous to utilize silicon-doped aluminum oxide as a gate dielectric material, and then utilized a general statement in Lee at col. 2, lns. 15-20 that a described dielectric material can be formed by any "conventional deposition technique such as sputtering,..." to contend that Applicant's claim 10 prior to amendment was obvious. Application believes that such conclusion would be erroneous relative to amended claim 10 since, as discussed above, the Examiner's cited references fail to suggest or disclose specific recited features of the claim 10 process. In fact, the sputtering techniques described specifically in Lee are very different from Applicant's recited method in that Lee's process utilizes an aluminum target with 1% by weight silicon distributed uniformly therein for forming silicon-doped films (col. 5, lns. 62-65 of Lee). Applicant respectfully submits that it would be improper for the Examiner to infer that Applicant's recited method of mixing evaporated aluminum oxide from single crystal sapphire with evaporated silicon monoxide is an obvious permutation of the "conventional deposition techniques" described in Lee when Lee has no specific description of any technique similar to that described by Applicant. Further, it would be improper for the Examiner to contend that Applicant's technique is a "conventional" technique when the Examiner has no reference specifically describing Applicant's technique. In other words, it would be improper to conclude that Applicant's recited formation of a mixture of evaporated aluminum oxide from single crystal sapphire and evaporated silicon monoxide is an obvious permutation of

various processes described in Vossen and Kern, when the reference itself fails to support the conclusion.

Vossen and Kern describe evaporation of aluminum oxide generally, and evaporation of silicon monoxide generally, but has no teaching of two-source systems utilizing aluminum oxide and silicon monoxide; and does not even refer to aluminum oxide evaporated from single crystal sapphire. Although the Vossen and Kern reference has a table indicating that two-source evaporation systems are known for several listed materials, the reference notably does not include a two-source evaporation system of aluminum oxide and silicon monoxide within the table. Applicant respectfully submits that it is improper for the Examiner to contend that the listed two-source evaporation systems of Vossen and Kern can be extended to Applicant's recited system without some teaching of a reason for making such system, and a reasonable expectation of success. In the present case, the only disclosure of record which teaches a reason for forming a two-source evaporation system comprising aluminum oxide from single crystal sapphire and silicon monoxide is the text of Applicant's own application. The Examiner is reminded that it is improper to base a suggestion for combining references, or to base the reasonable expectation of success of making a proposed modification of a reference on Applicant's disclosure, rather than the prior art. (See, for example, MPEP § 706.02(j).) Since the only teaching or suggestion of mixing evaporated aluminum oxide from single crystal sapphire with evaporated silicon monoxide in any context, and specifically in the context of forming silicon-doped aluminum oxide over a silicon substrate, is in Applicant's disclosure, the Examiner's cited references fail to show that the prior art would teach or suggest all of the limitations of amended claim 10.

For this additional reason, claim 10 is allowable over the cited references, and Applicant therefore requests such allowance in the Examiner's next Action.

Claims 2, 3, 5, 6, 8, 9, 31 and 32 depend from claim 10, and are therefore allowable for at least the reasons discussed above regarding claim 10.

For the above-discussed reasons, pending claims 2, 3, 5, 6, 8-10, 31 and 32 are allowable, and Applicant therefore requests formal allowance of such claims in the Examiner's next Action.

Respectfully submitted,

Dated: 11/20/02 By: _____

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VERSION WITH MARKINGS TO SHOW CHANGES MADE ACCOMPANYING RESPONSE TO OCTOBER 7, 2002 OFFICE ACTION

In the Claims

The claims have been amended as follows. Underlines indicate insertions and ~~strikeouts~~ indicate deletions.

2. (Amended) The method of claim 10 ~~wherein the co-evaporating and depositing are conducted in a chamber, and~~ wherein there is no O_2 flowed into the chamber during the ~~co-evaporation~~ mixing and deposition.

3. (Amended) The method of claim 10 wherein the ~~co-evaporating~~ evaporating the aluminum oxide comprises thermal evaporation of the aluminum oxide from the single crystal sapphire.

4. Cancelled.

5. (Amended) The method of claim 10 wherein the ~~co-evaporating~~ evaporating the aluminum oxide comprises ion beam evaporation of the aluminum oxide from the single crystal sapphire.

6. (Amended) The method of claim 10 wherein the ~~co-evaporating~~ evaporating the aluminum oxide comprises electron gun evaporation of the aluminum oxide from the single crystal sapphire.

7. Cancelled.

8. The method of claim 10 wherein the substrate comprises silicon.

9. The method of claim 10 wherein the substrate comprises monocrystalline silicon.

10. (Amended) A method of forming an assembly comprising silicon-doped aluminum oxide, comprising:

evaporating aluminum oxide from a single crystal sapphire;

evaporating silicon monoxide from a source of silicon monoxide;

mixing the evaporated aluminum oxide and silicon monoxide in a reaction chamber to form a mixture;

~~co-evaporating aluminum oxide and silicon monoxide;~~

depositing at least some of the mixture of evaporated aluminum oxide and silicon monoxide on a semiconductive material substrate to form the silicon-doped aluminum oxide on the substrate; and

forming a conductive material on the deposited silicon-doped aluminum oxide,

the conductive material being separated from the semiconductive material of the substrate by the silicon-doped aluminum oxide.

30. Cancelled.

31. The method of claim 10 wherein the silicon-doped aluminum oxide contains from 0.1 percent to about 30 weight percent of silicon dopant, by weight.

32. The method of claim 10 wherein the semiconductive material substrate is room temperature during the depositing.

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